AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Original) A method for enhancing vision in an animal under conditions of low intensity light comprising delivering up-conversion materials to the eye of the animal,

wherein the up-conversion materials absorb infrared light, and

wherein the up-conversation materials luminescence in the visible range of the electromagnetic spectrum.

2. (Original) A method according to claim 1, further comprising exposing the eye of the animal to a source of light of a wavelength sufficient to excite the up-conversion materials.

3. (Original) A method according to claim 1, wherein the up-conversion materials comprise one or more lanthanoid ions.

4. (Original) A method according to claim 1, wherein the up-conversion materials comprise a semiconductor with a band gap in the infrared.

5. (Original) A method according to claim 3, wherein the lanthanoid ion is selected from the group consisting of Pr, Nd, Eu, Er, Gd, and Yb.

6. (Original) A method according to claim 5, wherein the lanthanoid ion comprises Er.

7. (Original) A method according to claim 1, wherein the up-conversion materials are in the form of nanoparticles.

8. (Original) A method according to claim 7, wherein the nanoparticles comprise SiO_2.

9. (Original) A method according to claim 7, wherein the nanoparticles comprise CdSe.

10. (Original) A method according to claim 1, wherein the up-conversion materials comprise a lanthanoid ion in a glass.

11. (Original) A method according to claim 7, wherein the nanoparticles are covalently bound to an antibody, wherein the antibody is specific for an antigen on a protein component of the eye.

12. (Original) A method according to claim 11, wherein the antibody is an antibody specific for a rod protein.

13. (Original) A method according to claim 11, wherein the antibody is specific for a cone protein.

14. (Original) A method according to claim 11, wherein the antibody is specific for ROM-1.

15. (Original) A method according to claim 11, wherein the antibody is specific for peripherin.

16. (Original) A method according to claim 11, wherein the antibody is specific for arrestin.

17. (Original) A method according to claim 11, wherein the antibody is specific for rhodopsin.

18. (Original) A method according to claim 1, wherein delivering the up-conversion material to the eye is carried out with iontophoresis.

19. (Original) A method according to claim 1, wherein the animal is a human.

20. (Original) A method according to claim 1, wherein the animal is non-human.

21. (Original) A composition comprising a nanoparticle covalently bound to an antibody, wherein the nanoparticle comprises an up-conversion material that absorbs electromagnetic radiation having a wavelength greater than about 650 nm and luminesces in the visible region of the electromagnetic spectrum, and the antibody is an antibody specific to a protein component of the eye.

A1 cont.

22. (Original) A composition according to claim 21, wherein the antibody is specific to an antigen selected from the group consisting of rod proteins, cone proteins, ROM-1, peripherin, arrestin, S-antigen, and rhodopsin.

23. (Original) A composition according to claim 21, wherein the up-conversion material comprises one or more lanthanoid ions.

24. (Original) A composition according to claim 21, wherein the up-conversion material comprises a semiconductor having a band gap in the infrared.

25. (Original) A composition according to claim 21, wherein the nanoparticles comprise SiO_2.

26. (Original) A composition according to claim 21, wherein the nanoparticles comprise an organic polymer.

27. (Original) A composition according to claim 21, wherein the antibody is an antibody specific to peripherin.

28. (Original) A composition according to claim 21, wherein the antibody is an antibody specific to ROM-1.

29. (Currently Amended) A method of providing a living being with ~~An animal having~~ enhanced vision, the method comprising ~~wherein an up-conversion material is~~ optically coupling an infrared absorbing material ~~coupled~~ to ~~the~~ photoreceptors of at least one eye of the living being ~~animal~~.

30. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion of the~~ material comprises nanoparticles ~~comprising a material~~ that ~~absorbs~~ absorb infrared and luminesce visible light.

31. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion~~ material comprises one or more lanthanoid ions.

32. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion~~ material comprises two or more different lanthanoid ions.

33. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion~~ material comprises a semiconductor material having a band gap in the infrared.

34. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion~~ material is bound to an antibody that preferentially binds to a portion of one of the biomaterials in the eye.

35. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to a rod protein.

36. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to a cone protein.

37. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to ROM-1.

38. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to peripherin.

39. (Currently Amended)The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to X-arrestin.

40. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to S-antigen.

41. (Currently Amended) The method ~~An animal~~ according to claim 34, wherein the antibody is an antibody to rhodopsin.

42. (Currently Amended) The method ~~An animal~~ according to claim 29, wherein the ~~up-conversion~~ material is optically coupled to two eyes of the living being ~~animal~~.

43. (Currently Amended) The method ~~A dog~~ according to claim 29 wherein the living being is a dog.

44. (Original) A method for visualizing an object under conditions of low ambient light comprising:

exposing the object to incident electromagnetic radiation having a wavelength greater than what can be seen by the naked eye; and

perceiving light reflected from the object with an enhanced eye,

wherein the enhanced eye comprises an up-conversion material optically coupled to the photoreceptors of the eye,

wherein the up-conversion material absorbs light of the wavelength reflected from the object, and luminesces in the visible region of the electromagnetic spectrum.

45. (Original) A method according to claim 44, wherein the up-conversion material comprises one or more lanthanoid ions.

46. (Original) A method according to claim 44, wherein the up-conversion material comprises two or more different lanthanoid ions.

47. (Original) A method according to claim 44, wherein the up-conversion material comprises a semiconductor having a band gap in the infrared.

48. (Original) A method according to claim 44, wherein the up-conversion material is in the form of a nanoparticle covalently bound to an antibody, wherein the antibody is specific for an antigen in a biomaterial found in the eye.

49. (Original) A method according to claim 48, wherein the antibody is an antibody to a rod protein.

50. (Original) A method according to claim 48, wherein the antibody is an antibody to a cone protein.

51. (Original) A method according to claim 48, wherein the antibody is an antibody to ROM-1.

52. (Original) A method according to claim 48, wherein the antibody is an antibody to peripherin.

53. (Original) A method according to claim 48, wherein the antibody is an antibody to S-antigen.

54. (Original) A method according to claim 48, wherein the antibody is an antibody to X-arrestin.

55. (Original) A method according to claim 44, wherein the incident electromagnetic radiation is light of a single frequency.

56. (Original) A method according to claim 44, wherein the incident electromagnetic radiation is coherent laser light.

57. (Original) A method according to claim 55, wherein the source of the light is a light emitting diode.

58. (Original) A method according to claim 44, wherein the object is continuously illuminated.

59. (Original) A method according to claim 44, wherein the object is illuminated by a source of non-classical light.

60. (Original) A method according to claim 44, further comprising providing a source of photons separate from the light reflected from the object, wherein the photons excite the up-conversion materials.

61. (Original) A method for visualizing an object with an enhanced eye, wherein the enhanced eye comprises an up-conversion material optically coupled to the photoreceptors of the eye, comprising

providing the eye with a first source of photons that sensitize the up-conversion material; and

providing the eye with a second source of photons reflected from the object, wherein the up-conversion material absorbs the light reflected from the object and luminesces in the visible.

62. (Original) A method according to claim 61, wherein the first source of photons is delivered to the eye without reflecting off the object.

63. (Original) A method according to claim 61, wherein the first source of photons has a wavelength of 1000 nm or less.

64. (Original) A method according to claim 61, wherein the second source of photons has a wavelength of 1500 nm or greater.

65. (Original) A method according to claim 61, wherein the second source of photons is from a CO_2 laser.

66. (Original) A method according to claim 61, wherein the first source of photons is provided by a light emitting diode.

67. (Original) A method according to claim 61, wherein the up-conversion material is in the form of nanoparticles.

68. (Original) A method according to claim 67, wherein the nanoparticle is covalently bound to an antibody for a protein component of the eye.

69. (Original) A method according to claim 67, wherein the antibody is an antibody specific for ROM-1 or peripherin.